

LOW DROP POWER SCHOTTKY RECTIFIER

MAIN PRODUCTS CHARACTERISTICS

$I_{F(AV)}$	2 x 7.5 A
V_{RRM}	45 V
$T_j (max)$	150 °C
$V_F (max)$	0.46 V

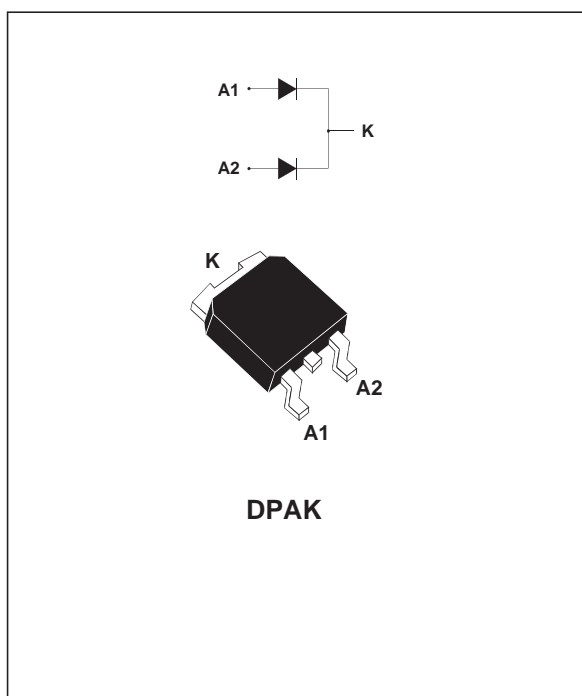
FEATURES AND BENEFITS

- VERY SMALL CONDUCTION LOSSES
- NEGLIGIBLE SWITCHING LOSSES
- EXTREMELY FAST SWITCHING
- LOW FORWARD VOLTAGE DROP
- AVALANCHE CAPABILITY SPECIFIED

DESCRIPTION

Dual center tab Schottky rectifier suited for Switch Mode Power Supply and high frequency DC to DC converters.

Package in DPAK, this device is intended for use in low voltage, high frequency inverters, free-wheeling and polarity protection applications.



ABSOLUTE RATINGS (limiting values, per diode)

Symbol	Parameter			Value	Unit
V _{RRM}	Repetitive peak reverse voltage			45	V
I _{F(RMS)}	RMS forward current			10	A
I _{F(AV)}	Average forward current	T _c = 140°C δ = 0.5	Per diode Per device	7.5 15	A
I _{FSM}	Surge non repetitive forward current	tp = 10 ms sinusoidal		75	A
I _{RRM}	Peak repetitive reverse current	tp=2 μs square F=1kHz		1	A
P _{ARM}	Repetitive peak avalanche power	tp = 1μs T _j = 25°C		3700	W
T _{stg}	Storage temperature range			- 65 to + 175	°C
T _j	Maximum operating junction temperature *			150	°C
dV/dt	Critical rate of rise reverse voltage			10000	V/μs

* : $\frac{dP_{tot}}{dT_j} < \frac{1}{R_{th}(j - a)}$ thermal runaway condition for a diode on its own heatsink

STPS15L45CB

THERMAL RESISTANCES

Symbol	Parameter		Value	Unit
$R_{th(j-c)}$	Junction to case	Per diode	4	$^{\circ}\text{C/W}$
		Total	2.4	
$R_{th(c)}$	Coupling		0.7	

When the diodes 1 and 2 are used simultaneously :

$$\Delta T_j(\text{diode 1}) = P(\text{diode 1}) \times R_{th(j-c)}(\text{Per diode}) + P(\text{diode 2}) \times R_{th(c)}$$

STATIC ELECTRICAL CHARACTERISTICS (per diode)

Symbol	Parameter	Tests Conditions		Min.	Typ.	Max.	Unit
I_R^*	Reverse leakage current	$T_j = 25^{\circ}\text{C}$	$V_R = V_{RRM}$			1	mA
		$T_j = 125^{\circ}\text{C}$			23	45	mA
V_F^*	Forward voltage drop	$T_j = 25^{\circ}\text{C}$	$I_F = 7.5 \text{ A}$			0.52	V
		$T_j = 125^{\circ}\text{C}$	$I_F = 7.5 \text{ A}$		0.40	0.46	
		$T_j = 25^{\circ}\text{C}$	$I_F = 12 \text{ A}$			0.60	
		$T_j = 125^{\circ}\text{C}$	$I_F = 12 \text{ A}$		0.49	0.57	
		$T_j = 25^{\circ}\text{C}$	$I_F = 15 \text{ A}$			0.64	
		$T_j = 125^{\circ}\text{C}$	$I_F = 15 \text{ A}$		0.53	0.63	

Pulse test : * $t_p = 380 \mu\text{s}$, $\delta < 2\%$

To evaluate the conduction losses use the following equation :

$$P = 0.29 \times I_{F(AV)} + 0.023 I_{F(RMS)}^2$$

Fig. 1: Conduction losses versus average current.

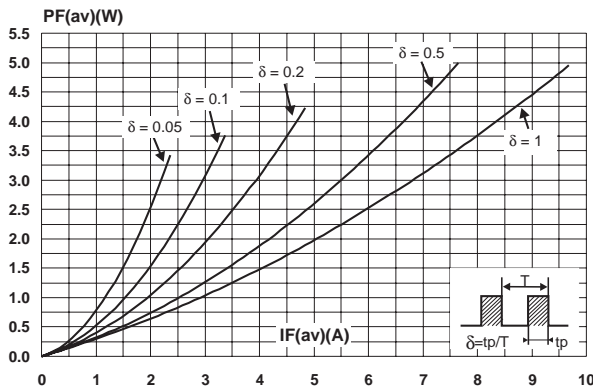


Fig. 3: Normalized avalanche power derating versus pulse duration.

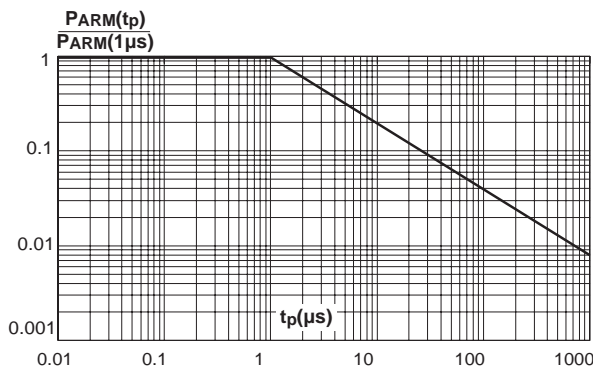


Fig. 2: Average forward current versus ambient temperature ($\delta = 0.5$).

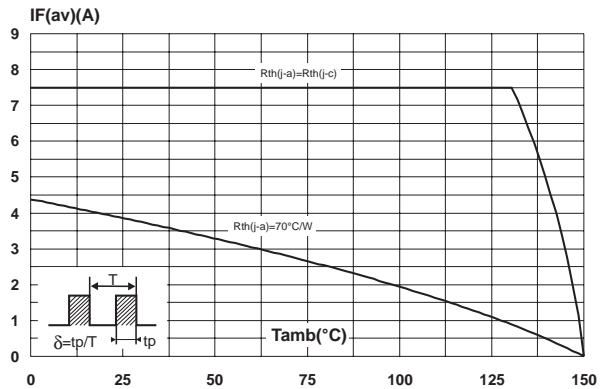


Fig. 4: Normalized avalanche power derating versus junction temperature.

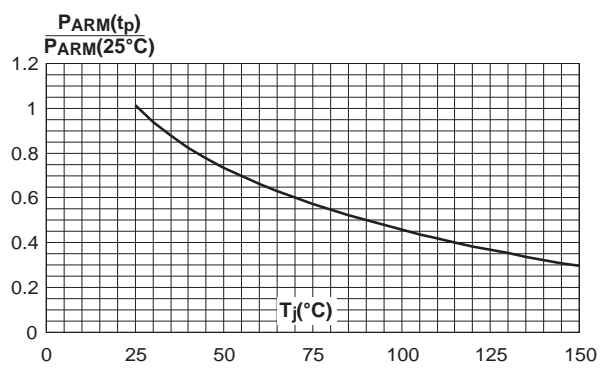


Fig. 5: Non repetitive surge peak forward current versus overload duration (maximum values).

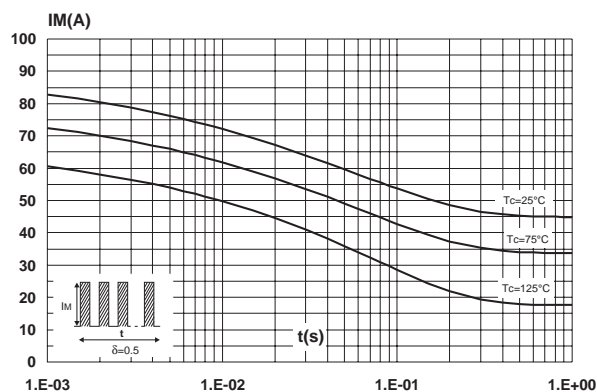


Fig. 6: Relative variation of thermal impedance junction to case versus pulse duration.

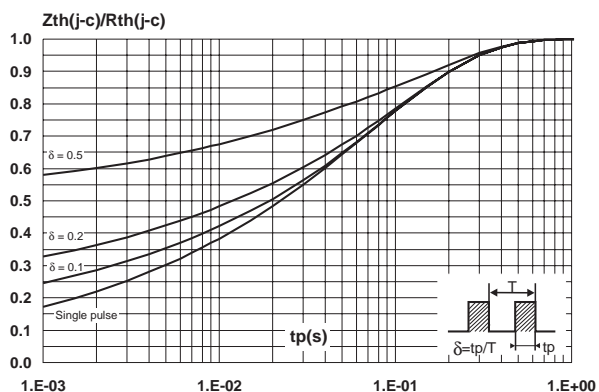


Fig. 7: Reverse leakage current versus reverse voltage applied (typical values).

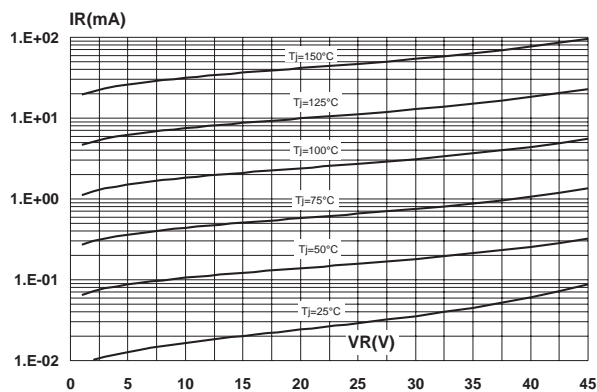


Fig. 8: Junction capacitance versus reverse voltage applied (typical values).

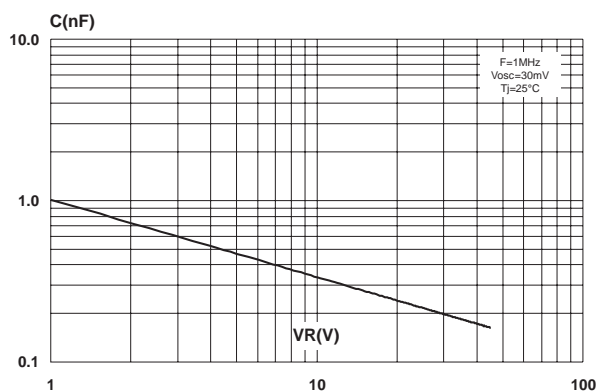


Fig. 9: Forward voltage drop versus forward current.

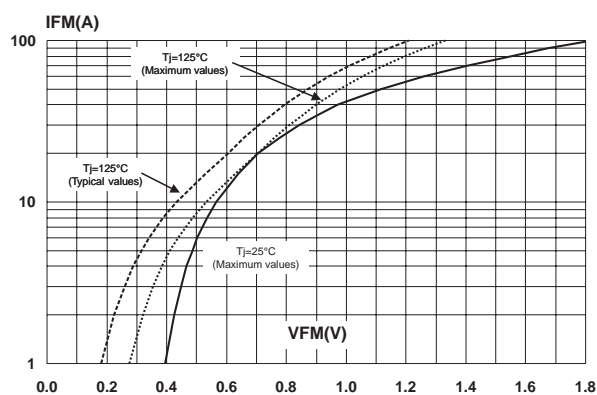
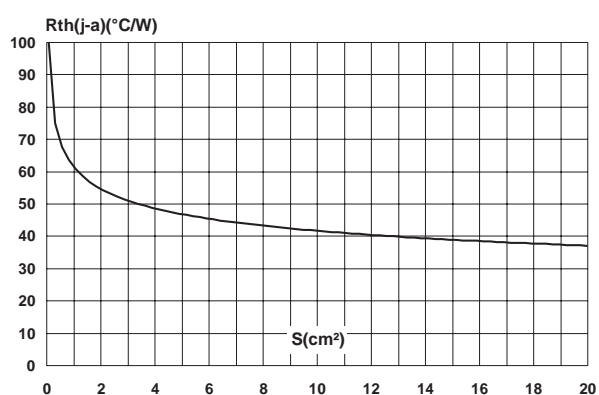
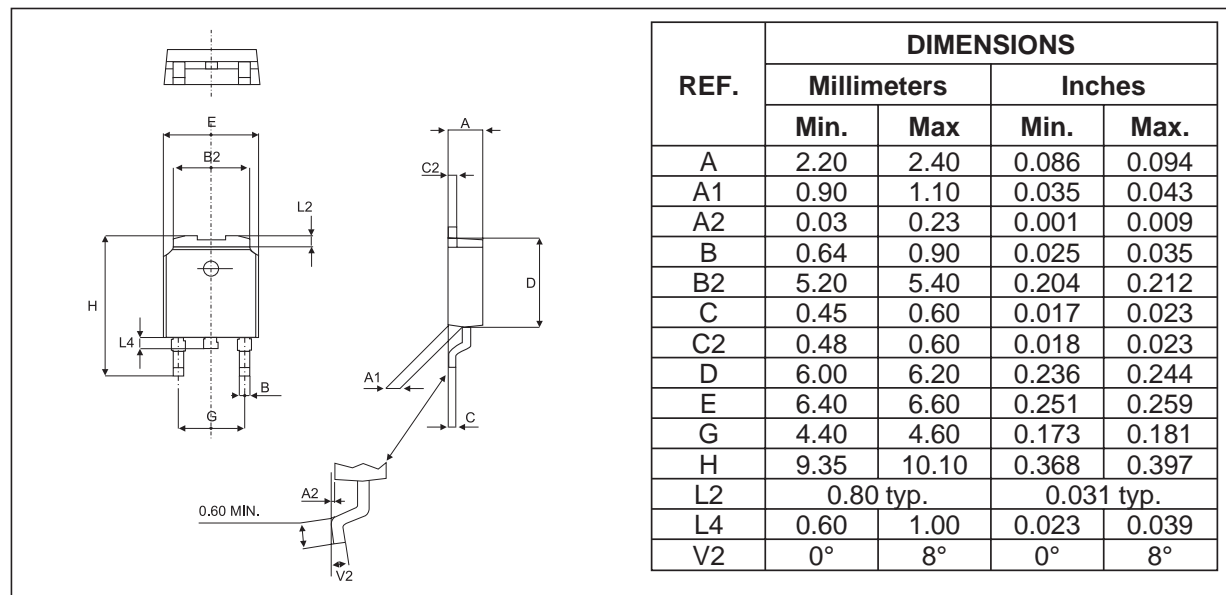
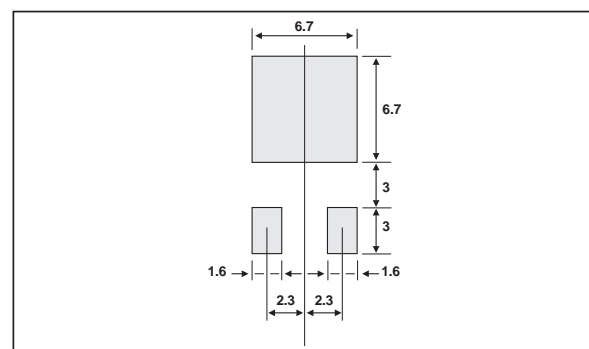


Fig. 10: Thermal resistance junction to ambient versus copper surface under tab (epoxy printed board FR4, Cu = 35 μm).



PACKAGE MECHANICAL DATA
DPAK

FOOTPRINT (dimensions in mm)


Ordering type	Marking	Package	Weight	Base qty	Delivery mode
STPS15L45CB	S15L45C	DPAK	0.30 g	75	Tube
STPS15L45CB-TR	S15L45C	DPAK	0.30 g	2500	Tape & reel

EPOXY MEETS UL94,V0

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